

## PHYSICAL PROPERTIES

Base Material	cellulose triacetate
Base Thickness	4.5 mils (nominal)
Oxide Thickness	0.4 mils (nominal)
Thickness Tolerance*	±5%
Yield Strength**	10,000 psi
Tensile Strength**	13,000 psi
Elongation at Break**	35%
Tear Strength	34 grams
Coefficient of Expansion	
for 1°F change	$3 \times 10^{-5}$
for 1% RH change	$4 \times 10^{-5}$

\*This tolerance represents the manufacturing limits for the base itself. In general, closer tolerances are met in any one roll.

\*\*These values have been determined by the standard procedure ASTM-D882-61T. In actual practice, where perforated film is used on sprockets, the observed strength depends upon the fit and alignment of teeth in the perforations, strain rate, etc. Typical values for actual usage are as follows: 35mm—Yield and/or Tensile Strength: 20 to 55 lbs. 16mm—Yield and/or Tensile Strength: 10 to 20 lbs.

## SIZES, CORES AND WINDINGS

Stock Rolls	Core	Perforation Type*	Winding for 16 and 17½mm Rolls
35 mm x 1000 ft.	K	KS-1866	
17½mm x 1000 ft.	Z	KS-1R-1866	Winding B
16 mm x 1000 ft.	Z	1R-2994	Winding A
16 mm x 1200 ft.	Z	1R-2994	Winding A

### Rolls available but not regularly stocked

16 mm x 1000 ft.	Z	1R-2994	Winding B
17½mm x 1000 ft.	Z	KS-1R-1866	Winding A
16 mm x 1200 ft.	Z	1R-2994	Winding B
16 mm x 1000 ft.	Z	2R-2994	
16 mm x 2000 ft.	Z	2R-2994	

\*Perforating of EASTMAN Magnetic Sound Recording Film is carried out to the same close tolerances as those used for EASTMAN Motion Picture Films. All rolls are wound on the cores with oxide coating in.

## IDENTIFICATION AND CODING

Just as all EASTMAN Motion Picture Films are identified as to manufacturer and emulsion number, so, too, is the new magnetic film. Printed at regular intervals on the back of EASTMAN Magnetic Sound Recording Film is a permanent legend (see illustration) with the words "Eastman Kodak Co." This is followed by a series of dispersion code numbers which provide positive coating identification as an aid to quality control in manufacturing.

For the user, this unique coding along the entire length of the film is more than a guarantee of quality. It also provides a convenient means of indexing films by content and makes possible a permanently useful reference log of optimum bias settings, re-use data, purchase dates, etc. And most important to all critical users, the name *Eastman Kodak* provides solid, permanent assurance of highest quality.



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# EASTMAN Magnetic Sound Recording Film

## TYPE A704

### GENERAL PROPERTIES

A magnetic recording film designed to give high output and a high signal-to-noise ratio, yet with an excellent print-through ratio. The unique binder material used provides magnetic dispersions of unusual abrasion resistance and produces a smooth-surfaced coating resulting in improved high-frequency sensitivity, low noise, and low amplitude modulation. High precision coating techniques and exacting manufacturing controls provide the ultimate in product uniformity.

Since no standard reference exists for perforated magnetic recording film, it is necessary to describe this film's bias level, sensitivity and frequency response in relation to EASTMAN Magnetic Sound Recording Film, Type A701. The output levels are referred to the ASA 400 cycle signal level test film PH.22.132. The same magnetic layer is used for all coatings of Type A704; therefore, the relative values listed here apply to each of the available widths. The following definitions describe the standards against which each magnetic property was measured:

**Bias Current**—EASTMAN Magnetic Sound Recording Film is designed for use with standard magnetic film recording equipment at bias current levels within the operating range.

**Nominal Bias**—Bias current required for maximum output of a 400 cps signal recorded at a negligible distortion level (10 db below 2% third harmonic distortion).

**Sensitivity**—Output for a 400 cps signal recorded at a level 10 db below that which gives 2% third harmonic distortion, nominal bias.

**Signal to Zero-Signal Noise Ratio**—Ratio of saturation output to the noise level, measured with no audio input but with nominal bias current, over a frequency range of 200 cps to 15,000 cps.

**Erase Ratio**—Measured for a 1,000 cps signal recorded at the saturation level with nominal bias. The film is recorded, incubated for four hours at 65°C, and played back with the output recorded. The film is then passed through a 60 cps A.C. field of 1,000 oersteds, after which the level of the residual signal is measured. The difference between the signal before erasure and the residual signal is the erase ratio.

**Frequency Response**—The db difference in output between a 400 cps signal and a signal of the frequency that results in 1.2 mil wavelength recorded with negligible distortion at nominal bias (6KC for 16mm and 15KC for 35mm and 17.5mm).

**Maximum Operating Level**—Output in db for which the third harmonic content of a 400 cps signal is 2% of the total, nominal bias.

**Saturation Output**—Maximum output obtainable irrespective of distortion, measured for a 400 cps signal recorded at nominal bias.

**Print-through Ratio**—Measured with nominal bias at wavelength of 31 mils (print-through ratio is lowest at this wavelength for film having normal support and coating thickness). Recorded level is the same as the 2% distortion level. Film is recorded and incubated for four hours at 65°C without rewinding. The print-through is then measured.

### MAGNETIC PROPERTIES

	Type A704	Type A701
Intrinsic Coercivity, Hc, (oe)	265	260
Retentivity, Br, (gauss)	1,000	1,000
Nominal Bias (db)	+ 1.5	0
Squareness Ratio	76%	75%
Sensitivity (db)	+ .5	0
Frequency Response (db)	- .5	0
Max. Operating Level (db)	+ 5.0	+2.0
Saturation Output (db)	+12.0	+9.0
Print-through Ratio (db)	> 56	56
Signal to Zero-Signal Noise Ratio (db)	80	75
Erase Ratio (db)	> 65	> 65